

Appl. No. 10/709,552
Amdt. dated March 31, 2006
Reply to Office action of February 07, 2006

Amendments to the Claims:

Listing of Claims:

Claim 1 (currently amended) A method of forming a barrier layer comprising:

- 5 (a) providing a substrate having a cobalt silicide and a plug hole exposing the cobalt silicide;
- (b) performing a chemical vapor deposition (CVD) process for forming a Ti/TiN film, functioning as the barrier layer, onto the cobalt silicide and inner walls of the plug hole;
- 10 (c) performing an examination procedure, and if particles are detected in the barrier layer, then performing step (d); and
- (d) performing a rework procedure comprising:
- performing a wet etching process to remove the barrier layer, the wet etching process being implemented with an acid solution
- 15 comprising phosphoric acid (H_3PO_4), nitric acid (HNO_3), acetic acid (CH_3COOH), and water (H_2O), wherein the ratio of phosphoric acid, nitric acid, acetic acid, and water in the acid solution is between (38-41):(1-1.5):(1.8-2.1):(2.8-3.2);
- scrubbing the substrate with a scrubber machine for removing
- 20 the particles;
- rinsing the substrate with a cleaning solution; and
- performing another CVD process for forming another Ti/TiN film onto the cobalt silicide and the inner walls of the plug hole.

25 Claims 2-4 (cancelled)

Claim 5 (original) The method of claim 1 wherein the cleaning solution is a sulfuric acid (H_2SO_4) solution.

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Claim 6 (original) The method of claim 1 wherein the examination procedure is performed for detecting the particles that influence electrical property.

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Claim 7 (currently amended) A method of forming a barrier layer comprising:

- (a) providing a substrate having at least a conducting layer thereon;
- (b) performing a chemical vapor deposition (CVD) process for forming
10 a Ti/TiN film onto the conducting layer;
- (c) performing an examination procedure, and if particles are detected in the Ti/TiN film, then performing step (d); and
- (d) performing a rework procedure comprising:
 - performing an etching process to remove the Ti/TiN film;
 - 15 scrubbing the substrate with a scrubber machine for removing the particles;
 - rinsing the substrate with a cleaning solution; and
 - performing another CVD process for forming another Ti/TiN film onto the conducting layer.

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Claim 8 (cancelled)

Claim 9 (original) The method of claim 7 wherein the conducting layer is a polysilicon layer.

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Claim 10 (original) The method of claim 7 wherein the conducting layer is a silicide layer.

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Claim 11 (original) The method of claim 7 wherein the conducting layer is a metal layer.

5 Claim 12 (original) The method of claim 7 wherein the etching process is a wet etching process.

10 Claim 13 (original) The method of claim 12 wherein the wet etching process is implemented with an acid solution comprising phosphoric acid (H_3PO_4), nitric acid (HNO_3), acetic acid (CH_3COOH), and water (H_2O).

Claim 14 (original) The method of claim 13 wherein the ratio of phosphoric acid, nitric acid, acetic acid, and water in the acid solution is between (38-41):(1-1.5):(1.8-2.1):(2.8-3.2).

15 Claim 15 (original) The method of claim 7 wherein the cleaning solution is a sulfuric acid.